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## **Class 73 MEASURING AND TESTING**

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- |                    |   |
|--------------------|---|
| <b><u>1.01</u></b> | <b>INSTRUMENT PROVING OR CALIBRATING</b>  |
| <u>1.02</u>        | . Gas or liquid analyzer  |
| <u>1.03</u>        | .. Reference standard   |
| <u>1.04</u>        | ... Permeable outlet or flawed element  |
| <u>1.05</u>        | ... Piston, sprayer, nozzle, or orifice   |
| <u>1.06</u>        | .. Gas  |
| <u>1.07</u>        | ... Span or zero  |
| <u>1.08</u>        | . Dynamometer   |
| <u>1.09</u>        | .. Torque   |
| <u>1.11</u>        | ... Electrical  |
| <u>1.12</u>        | ... Wrench  |
| <u>1.13</u>        | .. Weight   |
| <u>1.14</u>        | .. Rotor unbalance or a roller having a smooth surface                          |
| <u>1.15</u>        | .. Load cell (e.g., strain gauge or piezoelectric sensor)                       |
| <u>1.16</u>        | . Volume of flow, speed of flow, volume rate of flow, or mass rate of flow      |
| <u>1.17</u>        | .. Plug with leak detector  |
| <u>1.18</u>        | .. Sphere   |
| <u>1.19</u>        | .. Piston   |
| <u>1.21</u>        | ... With plural pistons   |
| <u>1.22</u>        | ... With magnetic or optical sensor   |
| <u>1.23</u>        | ... With position sensing switch  |
| <u>1.24</u>        | .. Tracer   |
| <u>1.25</u>        | .. Orifice or restriction   |
| <u>1.26</u>        | ... Nozzle or venturi   |
| <u>1.27</u>        | .. Turbine, geared meter, pulse activated, or counter                           |
| <u>1.28</u>        | ... Turbine or geared meter   |
| <u>1.29</u>        | .. Anemometer or pitot tube   |
| <u>1.31</u>        | .. With liquid level monitor or timer   |
| <u>1.32</u>        | ... Prover bell   |
| <u>1.33</u>        | .. With floating element or weighing  |
| <u>1.34</u>        | .. With signal processing, span or set point adjustment (e.g., zero correction) |
| <u>1.35</u>        | .. With pressure measurement or plural flowmeters                               |
| <u>1.36</u>        | .. Metering dispenser   |
| <u>1.37</u>        | . Speed, velocity, or acceleration  |
| <u>1.38</u>        | .. Acceleration utilizing an inertial element                                   |
| <u>1.39</u>        | ... Involving pendulum or impact  |
| <u>1.41</u>        | .. Optical or magnetic sensing  |
| <u>1.42</u>        | . Timing apparatus (e.g., fuse, camera, or shutter)                             |
| <u>1.43</u>        | .. Chronometer (e.g., clock, watch, or watch unbalance)                         |
| <u>1.44</u>        | ... Using antenna or radio frequency (RF)                                       |
| <u>1.45</u>        | ... Using optical sensor or element   |
| <u>1.46</u>        | .... With sound sensor  |
| <u>1.47</u>        | .... Resilient element  |
| <u>1.48</u>        | ... Using sound sensor or piezoelectric vibration sensor                        |
| <u>1.49</u>        | .... Plural watches or plural sensors   |
| <u>1.51</u>        | .... Resilient element  |

- 1.52 ... Plural watches
- 1.53 ... With resilient element
- 1.54 .... Coil spring
- 1.55 ..... Plural coil springs
- 1.56 .. Optical instrument (e.g., camera shutter) or optical sensor
- 1.57 . Fluid pressure
- 1.58 .. Vacuum
- 1.59 .. With signal correction or processing
- 1.61 ... Span
- 1.62 ... Zero
- 1.63 ... With reference source or attachment therefor
- 1.64 .... Varying
- 1.65 .. Dead weight type
- 1.66 .. Varying
- 1.67 ... Using or containing liquid
- 1.68 .. With piston and cylinder
- 1.69 .. Using or containing liquid
- 1.71 .. Pressure activated device
- 1.72 ... Valve
- 1.73 . Liquid level or volume measuring apparatus
- 1.74 .. Volumetric dispenser (e.g., pipette)
- 1.75 . Angle, direction, or inclination
- 1.76 .. Compass
- 1.77 .. Gyroscope
- 1.78 .. Aircraft, inertial navigation, or attitude
- 1.79 . Displacement, motion, distance, or position
- 1.81 .. Length, width, or height
- 1.82 . Apparatus for measuring by use of vibration or apparatus for measuring vibration (e.g., acoustic or ultrasonic)
- 1.83 .. Liquid
- 1.84 .. Rotary or rotor unbalance
- 1.85 .. Seismic (e.g., geophone) or with optical sensor
- 1.86 .. Reference standard detail
- 1.87 . Centrifuge
- 1.88 . Span or set point adjustment (e.g., zero correction)
- 1.89 . Roughness or hardness
- 7 **BY ABRASION, MILLING, RUBBING, OR SCUFFING**
- 8 . Wheel tread, tire, track, or roadway
- 9 **FRICTIONAL RESISTANCE, COEFFICIENT OR CHARACTERISTICS**
- 10 . Lubricant testing
- 11.01 **TESTING IMPACT DELIVERING DEVICE (E.G., A HAMMER)**
- 11.02 . Shot peener
- 11.03 . Pile driving hammer
- 11.04 **TESTING OF SHOCK ABSORBING DEVICE (E.G., AUTOMOBILE SHOCK ABSORBER, GUN RECOIL APPARATUS, ETC.)**
- 11.05 . Torsional vibration damper
- 11.06 . Railway draft gear
- 11.07 . In situ vehicle suspension
- 11.08 .. By applying reciprocating or oscillating motion
- 11.09 . By applying reciprocating or oscillating motion

**12.01      TESTING BY IMPACT OR SHOCK**

12.02      . Resilient ball (e.g., golf ball, baseball, etc.)

12.03      . Typewriting ribbon or carbon paper

12.04      . Accelerated or decelerated specimen (e.g., propelled or dropped specimen support carriage)

12.05      .. Particle or projectile specimen

12.06      .. Dropped

12.07      .. By hydraulic or pneumatic forces

12.08      . Specimen directly subjected to a fluid pressure pulse or wave

12.09      . Specimen impactor detail

12.11      .. Particle or projectile

12.12      .. Reciprocating or oscillating

12.13      .. Dropped

12.14      ... Pivoted

**19.01      GAS CONTENT OF A LIQUID OR A SOLID**

19.02      . By gas chromatography

19.03      . By vibration

19.04      . By rate of flow of the gas

19.05      . By pressure of the gas

19.06      .. Of a beverage

19.07      . Of metal

19.08      . Of concrete, mortar, or plastic while in a fluent state

19.09      . Of mud

19.1      . Of a liquid

19.11      .. Lubricant

19.12      . Particular separator

**23.2      GAS ANALYSIS**

23.21      . With compensation detail (for error or drift correction, etc.)

23.22      .. For gas chromatography

23.23      ... Baseline drift correction circuitry

23.24      ... Rate of flow

<u>23.25</u>	... Temperature
<u>23.26</u>	.... Gradient
<u>23.27</u>	... Pressure
<u>23.28</u>	.. For density or specific gravity
<u>23.29</u>	... Pressure
<u>23.3</u>	. Breath analysis
<u>23.31</u>	. Gas of combustion
<u>23.32</u>	.. Air-fuel ratio
<u>23.33</u>	... Solid content
<u>23.34</u>	. Odor
<u>23.35</u>	. Gas chromatography
<u>23.36</u>	.. With electrical computer or data processor control
<u>23.37</u>	.. With spectrometer
<u>23.38</u>	.. Petrochemical
<u>23.39</u>	.. Column detail
<u>23.4</u>	.. Detector detail
<u>23.41</u>	.. Including sample preparation or sampling
<u>23.42</u>	.. Detail of gas handling means
<u>24.01</u>	. By vibration
<u>24.02</u>	.. Produced by radiant energy
<u>24.03</u>	.. Solid content of gas
<u>24.04</u>	.. Moisture content or vapor pressure of gas
<u>24.05</u>	.. Density or specific gravity of gas
<u>24.06</u>	.. Detector detail
<u>25.01</u>	. By thermal property
<u>25.02</u>	.. With magnetic property (e.g., paramagnetic gas)
<u>25.03</u>	.. Thermoconductivity
<u>25.04</u>	.. Moisture content or vapor pressure
<u>25.05</u>	.. Detector detail
<u>28.01</u>	. Solid content of gas

<u>28.02</u>	.. Particle charging
<u>28.03</u>	.. Pressure
<u>28.04</u>	.. Separator detail
<u>28.05</u>	... Impactor
<u>28.06</u>	.... Fractionalizing
<u>29.01</u>	. Moisture content or vapor pressure
<u>29.02</u>	.. Hygrometer
<u>335.01</u>	... With optical element
<u>335.02</u>	... With electric circuitry or electric circuit component detail
<u>335.03</u>	.... Impedance
<u>335.04</u>	..... Capacitance
<u>335.05</u>	..... Resistance or conductivity
<u>335.06</u>	... Wet and dry responsive elements
<u>335.07</u>	.... With direct readout or calculator detail
<u>335.08</u>	.... Wet bulb detail
<u>335.09</u>	..... Relative air motion creating means (e.g., sling psychrometer)
<u>335.11</u>	... Expanding-sorption element
<u>335.12</u>	.... Coiled or twisted
<u>335.13</u>	.... Arcuate or elongated
<u>335.14</u>	.... Tensioned
<u>29.03</u>	.. Pressure
<u>29.04</u>	.. With visual indication
<u>29.05</u>	.. Detector detail
<u>30.01</u>	. Density or specific gravity
<u>30.02</u>	.. By pressure measurement
<u>30.03</u>	.. By rate of flow
<u>30.04</u>	.. Detector detail
<u>31.01</u>	. Ambient air
<u>31.02</u>	.. Impurity

- 31.03 . Impurity
- 31.04 . Pressure
- 31.05 . Detector detail
- 31.06 .. Semiconductor
- 31.07 . Particular separator

**32R****SPECIFIC GRAVITY OR DENSITY OF LIQUID OR SOLID**

- 433 . With weighing feature
- 434 .. Continuous test fluid supply
- 435 .. Plural supports for specimen
- 436 ... Vertically, commonly suspended
- 437 .. Immersion
- 438 . Hydrostatic pressure type
- 439 .. Bubble tube
- 440 . Multiple floats of graduated density
- 441 . Portable hand manipulable syringe type
- 442 .. With thermometer
- 443 ... With calculator
- 444 . Freely vertical reciprocable float with carried indicium
- 445 .. Continuous test fluid supply
- 446 .. With section means
- 447 .. With liquid level responsive gauge or compensator
- 448 .. Float structure
- 449 ... With carried thermometer or thermal compensator
- 450 ... Specimen carrying
- 451 . Float operated indicator
- 452 .. Continuous test fluid supply
- 453 .. Electrical indication
- 454 .. Pivoted float
- 32A . Involving vibration of substance or the measuring apparatus

**35.01****ENGINE DETONATION (E.G., KNOCK)**

- 35.02 . Fuel rating (e.g., octane rating)
- 35.03 . Combustion signal compared to reference signal varied by a condition of the engine
- 35.04 .. Including calculation means
- 35.05 .. Automatic gain control or feedback control
- 35.06 . Combustion signal compared to a fixed reference signal or utilizing a threshold value
- 35.07 . Specific type of detonation sensor
- 35.08 .. Ionization
- 35.09 .. Vibration
- 35.11 ... Piezoelectric
- 35.12 .. Pressure
- 35.13 ... Piezoelectric

**35.14      **EXPLOSIVE****

35.15      . By time measurement (e.g., burning rate, detonation velocity)

35.16      . Electric sensor

35.17      . Safety feature or containment structure

**36      **ILLUMINATING FLUID**  
**37      **WITH FLUID PRESSURE******

37.5      . Dimension, shape, or size

37.6      .. Moving specimen

37.7      ... Sheet or filament

37.8      .. Plural tests

37.9      .. Internal gauging

38      . Porosity or permeability

39      . Fluid pressure brake system or unit

40      . Leakage

40.5R      .. Fluid handling conduit in situ

40.5A      ... Using acoustic detectors

40.7      .. By probe gas, vapor, or powder

41      .. Conveyor feed

41.2      ... With immersion

41.3      .... Defective article discard

41.4      ..... Automatic

45      ... With defective article discard

45.1      .... Automatic

45.2      ..... Electrically controlled

45.3      ..... Vacuum support failure

45.4      ..... Sealed receptacle

45.5      .. With immersion

45.6      ... Pneumatic tire

45.7      .... Mesh envelope

45.8      ... Radiator

46      .. Between fitted parts (e.g., joints)

47      ... Piston, piston ring, or engine valve

48      ... Tire valve

49      .. Pneumatic tire

49.1      .. Pipe

49.2      .. Receptacle

49.3      ... Sealed

49.4      . With ram pressure inducer

49.5      . Pipe

49.6      .. With power-operated closure or seal

49.7      . Motor part or auxiliary

49.8      . Clamp, plug, or sealing feature

**52      **TESTING SEALED RECEPTACLE******53.01      **LIQUID ANALYSIS OR ANALYSIS OF THE SUSPENSION OF SOLIDS IN A LIQUID****

53.02      . Butter fat content

53.03      . Paper or wood suspension (e.g., paper or wood pulp)

53.04      .. By measuring fluid flow characteristic (e.g., by volume or rate of flow or by change in fluid level)

- 53.05 . Lubricant testing
- 53.06 .. By analyzing a characteristic of a measuring surface
- 53.07 .. By solid content
- 54.01 . Viscosity
- 54.02 .. Combined with other measuring means
- 54.03 .. Of concrete (e.g., slump indicator)
- 54.04 .. Friction tube (e.g., capillary)
- 54.05 ... Plural tubes
- 54.06 .... By pressure measuring
- 54.07 ... By time interval of travel or flow rate measuring
- 54.08 .... Including a photocell
- 54.09 ... By pressure measuring
- 54.11 .. Orifice, nozzle, or extrusion means
- 54.12 ... Plural fluids (e.g., comparison)
- 54.13 ... By time interval of travel or flow rate measuring
- 54.14 ... By force, pressure, or displacement measuring
- 54.15 .. Gravity movement of an object in a liquid (e.g., a bubble)
- 54.16 ... With detail of temperature or pressure regulating or compensating means
- 54.17 ... Using a reference fluid
- 54.18 ... With means for restoring an object to its initial starting position (e.g., magnetic or fluid means)
- 54.19 ... Including detail of a timing detection circuit
- 54.21 ... Including an object concentricity guide means
- 54.22 .. Adhesion between wetted surfaces
- 54.23 .. Force reactance to member driven therein
- 54.24 ... By vibration
- 54.25 .... Dampening effect (e.g., frequency, amplitude, speed, or power measurement)
- 54.26 .... With detail of a drive means or a detecting means
- 54.27 .... With detail (e.g., circuitry) of a drive means or a detecting means
- 54.28 ... Rotationally driven member



- 54.29 .... Comparator
- 54.31 .... By measuring the driving force or the speed of the driven member
- 54.32 .... By measuring an opposed drag force
- 54.33 ..... By measuring angular displacement
- 54.34 ..... By measuring a counterbalance or restoring force
- 54.35 .... Including detail of a motor drive, a stator, or a housing structure of a motor
- 54.36 ... Penetrometer
- 54.37 ... By movement or displacement between shearing surfaces
- 54.38 ... Detector detail
- 54.39 .. Shearing torque between parallel surfaces
- 54.41 .. Vibration
- 54.42 .. Thermal
- 54.43 .. With detail of a pressure or a temperature regulating means
- 60.11 . Cleaning or foaming ability
- 61.41 . Content or effect of a constituent of a liquid mixture
- 61.42 .. Metallic particle constituent
- 61.43 .. Liquid constituent of a liquid mixture
- 61.44 ... Plural liquid constituent (e.g., multiphase liquid)
- 61.45 .... By vibration
- 61.46 ... By thermal measurement
- 61.47 ... By pressure measurement
- 61.48 ... By optical irradiation
- 61.49 ... By vibration
- 61.51 ... Buoyant detector
- 61.52 ... Chromatography
- 61.53 .... Column detail
- 61.54 .... Paper or thin layer type
- 61.55 .... Including sampling, sample handling, or sample preparation
- 61.56 .... Detail of fluid handling means (e.g., valve, control, etc.)

- 61.57 .... With detail of compensation or regulating means
- 61.58 .... Detector detail
- 61.59 ... With detail of sampling, sample handling, or sample preparation
- 61.61 ... Detector detail
- 61.62 .. Depositing characteristic
- 61.63 .. Settling or filtering ability
- 61.64 ... By volume or flow rate
- 61.65 ... Sedimentation rate
- 61.66 .... With means for accelerating solids (e.g., particles)
- 61.67 .... By pressure measurement
- 61.68 .... Including detail of fluid handling means, sampling, sample handling, or sample preparation
- 61.69 .... By optical measurement
- 61.71 .. For measuring solid components (e.g., particles)
- 61.72 ... By separation and subsequent measurement (e.g., by weighing, X-ray or microscope, etc.)
- 61.73 ... By flowing through barrier or restriction and measuring flow effect (e.g., pressure, volume of or rate of flow)
- 61.74 .... Thermal
- 61.75 ... Vibration
- 61.76 .. By thermal measurement
- 61.77 ... Vaporization (e.g., evaporation, distillation, etc.)
- 61.78 .. By pressure measurement
- 61.79 .. By vibration
- 64.41 . Gelling or coagulation
- 64.42 .. By vibration
- 64.43 .. By optical measurement
- 64.44 . Vapor-liquid ratio
- 64.45 . Vapor pressure
- 64.46 .. Differential pressure
- 64.47 . Osmotic pressure (e.g., diffusion characteristic)
- 64.48 . Surface tension

- 64.49 .. By force or torque
- 64.51 .. By pressure
- 64.52 .. Liquid droplet
- 64.53 . By vibration
- 64.54 . Molecular weight
- 64.55 . Interface
- 64.56 . Sampler, constituent separation, sample handling, or sample preparation

### **65.01 CENTER OF GRAVITY; TURNING MOMENT; METACENTRIC HEIGHT**

- 65.02 . Spherical specimen
- 65.03 . Ball driving sporting implement (e.g., golf club, baseball bat, etc.)
- 65.04 . Watercraft (e.g., metacentric height)
- 65.05 . Air or space vehicle
- 65.06 .. Electric sensor
- 65.07 . Dynamic
- 65.08 .. Torsional oscillation
- 65.09 . Electric sensor

### **66 ROTOR UNBALANCE**

- 455 . Propeller, impeller, or fluid coupling
- 456 .. Single blade balancing
- 457 . In situ
- 458 .. With counterbalancing means
- 459 . Combined static and dynamic
- 460 . Dynamic (spinning)
- 461 .. Mass centering
- 462 .. With electrical sensor and indicator
- 463 ... Wattmeter
- 464 ... Rotatable switch
- 465 ... Oscilloscope (cathode ray)
- 466 ... Stroboscopically illuminated
- 467 .... Indicator
- 468 .. With counterbalancing means
- 469 ... By radially and circumferentially adjustable weights
- 470 ... By circumferentially adjustable weights
- 471 .. With vibratable mount feature
- 472 ... Free floating rotor
- 473 .... Horizontal axis
- 474 ... One rotor end universally tiltable
- 475 ... Horizontal rotational axis
- 476 .... Horizontal plane of vibration
- 477 ..... Both ends free
- 478 ..... With selective endlock
- 479 .... Horizontal fulcrum

<u>480</u>	. Gravitational moment turns rotor about spin axis
<u>481</u>	.. Ways
<u>482</u>	. Gravitational moment tilts rotor about axis transverse to spin axis
<u>483</u>	.. Universally tiltable
<u>484</u>	... With tapered rotor centering means
<u>485</u>	... With expansible or contractible centering means
<u>486</u>	... With suspension means
<u>487</u>	. Tool and adjunct
<u>570</u>	<b>VIBRATION</b>
<u>570.5</u>	. Acoustic levitation
<u>571</u>	. Test chamber
<u>572</u>	. Loose object detection
<u>573</u>	. Hardness or compliance
<u>574</u>	. Mechanical impedance
<u>575</u>	.. Of an elastomer
<u>576</u>	.. Device having an electromagnetic drive
<u>577</u>	. Fatigue study
<u>578</u>	.. Electromagnetic drive
<u>579</u>	. Resonance, frequency, or amplitude study
<u>580</u>	.. Including weight determination
<u>581</u>	.. Including axial force determination
<u>582</u>	.. Including structural bond evaluation
<u>583</u>	.. Of aircraft or related structural element
<u>584</u>	. By mechanical waves
<u>585</u>	.. Including ear or hearing testing
<u>586</u>	.. Reverberation
<u>587</u>	.. Acoustic emission
<u>588</u>	.. Structural bond evaluation
<u>589</u>	.. Acoustical impedance
<u>590</u>	.. In detection of a liquid reaction, a chemical reaction, or a nuclear reaction
<u>591</u>	.. Listening or sound tube
<u>592</u>	.. Fluid, fluid leak, or pipe flaw detection
<u>593</u>	.. Bearing, gear, or related moving mechanism
<u>594</u>	.. Soil or building structure
<u>595</u>	.. Frangible
<u>596</u>	.. Beamed
<u>597</u>	... Velocity or propagation time measurement
<u>598</u>	.... For flaw or discontinuity detection
<u>599</u>	... Attenuation measurement
<u>600</u>	.... For flaw or discontinuity detection
<u>601</u>	... Having plural, diverse forms of radiant energy
<u>602</u>	... With signal analyzing or mathematical processing
<u>603</u>	... Acoustic holography
<u>604</u>	.... Having means substituted for reference signal
<u>605</u>	.... Liquid or deformable surface holography
<u>606</u>	... Imaging of discontinuity with stationary sonic transmitter
<u>607</u>	.... By scan of a sonic receiver
<u>608</u>	.... By Bragg diffraction
<u>609</u>	... Measuring or testing system having threshold, gating, delay, or blocking means
<u>610</u>	.... Electronic gating
<u>611</u>	..... Adjustably responsive to information signal
<u>612</u>	..... Plural gating
<u>613</u>	..... Of noise
<u>614</u>	..... Of signals to pass only echoes from within test body
<u>615</u>	..... Of signals to pass only echoes from front surface or flaw and from rear surface of test body
<u>616</u>	..... Of signals to pass only echoes from rear surface of test body

<u>617</u>	.... Having mechanical delay or mechanical blocking
<u>618</u>	... Measuring or testing system having scanning means
<u>619</u>	.... Programmed scan
<u>620</u>	.... By reflected wave
<u>621</u>	..... Having compound scan
<u>622</u>	..... Of tubing, vessel, or cylindrical object
<u>623</u>	..... Scan from within object
<u>624</u>	..... Having separate sonic transmitter and receiver
<u>625</u>	..... Having plural sonic type transmitter or receiver transducers
<u>626</u>	..... Switched
<u>627</u>	... By reflected wave
<u>628</u>	... Having plural sonic type transmitters or receivers transducers
<u>629</u>	... Having unitary sonic type transmitter-receiver transducer
<u>630</u>	..... Establishing resonance in a test body
<u>631</u>	..... Having automatic gain control
<u>632</u>	... Sonic wave transmitter or receiver transducer
<u>633</u>	... Having transducer scanning means
<u>634</u>	..... Automatic transducer positioning
<u>635</u>	..... Rolling contact
<u>636</u>	..... On railroad rails
<u>637</u>	..... Around cylindrical object
<u>638</u>	..... Along cylindrical object
<u>639</u>	..... Transducer forms wheel or is within a wheel
<u>640</u>	..... Scanning curved surface in direction of curvature
<u>641</u>	..... Plural sonic transmitters or receivers
<u>642</u>	... Having wave shaping means
<u>643</u>	... Nonvibrating transducer
<u>644</u>	... Having significant coupling means
<u>645</u>	.. Acoustic parameter
<u>646</u>	... Amplitude, power, or intensity
<u>647</u>	... Current generating or modifying
<u>648</u>	..... Frequency sensitive
<u>649</u>	. Sensing apparatus
<u>650</u>	.. Torsional
<u>651</u>	.. Vibratable reed
<u>652</u>	.. With inertia element
<u>653</u>	... With light beam indicator
<u>654</u>	... With electrically controlled indicator
<u>655</u>	.. With light beam indicator
<u>656</u>	... By optical holography
<u>657</u>	... By frequency or phase shift
<u>658</u>	.. With electrically controlled indicator
<u>659</u>	... Spectrum analysis
<u>660</u>	... Rotating machinery or device
<u>661</u>	... Having a probe
<u>662</u>	. Vibrator
<u>663</u>	.. Table, platform, or other support
<u>664</u>	... Circuitry
<u>665</u>	... Having fluid bearing or fluid pressure actuated
<u>666</u>	... Having spring support
<u>667</u>	... Eccentrically vibrated
<u>668</u>	... Electromagnetically vibrated
<u>669</u>	.. Vehicle shaker
<u>670</u>	... Treadmill
<u>671</u>	.. Having a fluid jet
<u>672</u>	.. Having a rotatable imbalanced mass
<u>73</u>	<b>MOISTURE CONTENT OR ABSORPTION CHARACTERISTIC OF MATERIAL</b>
<u>74</u>	. By residual capacity measurement

<u>75</u>	. By heat conductivity
<u>76</u>	. By desiccation or extraction
<u>77</u>	. By wet and dry bulb temperature
<u>78</u>	<b>HARDNESS</b>
<u>79</u>	. Scleroscope or rebound
<u>81</u>	. By penetrator or indenter
<u>82</u>	.. Impact type
<u>83</u>	.. With successive minor and major load
<u>84</u>	.. Soil bearing capacity
<u>85</u>	.. Penetrator element
<u>86</u>	<b>EMBRITTLEMENT OR EROSION</b>
<u>87</u>	<b>DUCTILITY OR BRITTLINESS</b>
<u>760</u>	<b>SPECIMEN STRESS OR STRAIN, OR TESTING BY STRESS OR STRAIN APPLICATION</b>
<u>761</u>	. Threaded fastener stress
<u>762</u>	. Indicating coating or sheet providing direct visual indication (e.g., cracking, color change)
<u>763</u>	. Specified electrical sensor or system
<u>764</u>	.. Having level attainment counter
<u>765</u>	.. Compensation (e.g., linearization)
<u>766</u>	... Temperature
<u>767</u>	.. Plural sensors at single location (e.g., diverse orientation, plural level)
<u>768</u>	.. Sensor embedded in specimen
<u>769</u>	.. Coupling circuit for specific additional purpose (e.g., noise suppression) or having specified structure
<u>770</u>	... Peak indicating system
<u>771</u>	... Having selector switching means
<u>772</u>	... Plural sensed signal system
<u>773</u>	... Specified signal transmitting link
<u>774</u>	.. Specified sensor structure
<u>775</u>	... Bonded to specimen
<u>776</u>	.... Sensor comprises coating
<u>777</u>	... Semiconductor
<u>778</u>	... Vibratory element
<u>779</u>	... Magnetic or inductive
<u>780</u>	... Capacitive
<u>781</u>	. Specified load or strain transmission device from specimen to electrical detector
<u>782</u>	.. Strain multiplier
<u>783</u>	. Deformation or change in stress after fracture, cutting, or boring
<u>784</u>	. Earth stresses
<u>785</u>	. Prestressed specimen
<u>786</u>	. In static structures (e.g., buildings, bridges)
<u>787</u>	. Stress or strain history of a specimen without application of a load
<u>788</u>	. By loading of specimen (e.g., strength of material test)
<u>789</u>	.. Stress-strain relationship determination
<u>790</u>	... Compression
<u>791</u>	... Graphical output
<u>792</u>	.... Moving chart
<u>793</u>	..... Drum
<u>794</u>	.. Plural diverse stress-strain tests or composite loads
<u>795</u>	... Strain
<u>796</u>	... Tension-compression
<u>797</u>	.... Alternating
<u>798</u>	.... Hydraulic or pneumatic actuation
<u>799</u>	.. Specimen cracking or crack propagation
<u>800</u>	.. Optical
<u>801</u>	.. Acoustic emission
<u>802</u>	.. Aircraft structure

<u>803</u>	.. Concrete
<u>804</u>	.. Model of structure to determine structure properties
<u>805</u>	.. Varied in response to specimen condition other than failure
<u>806</u>	.. Varied according to predetermined pattern
<u>807</u>	... Applied directly by fluid pressure
<u>808</u>	... Repetitive
<u>809</u>	.... Plural specimen
<u>810</u>	.... To failure
<u>811</u>	.... Electric control circuit or particular loading device
<u>812</u>	.... Flexing, bending, or folding
<u>813</u>	.... Compressive
<u>814</u>	.... Torsional
<u>815</u>	.... Shear
<u>816</u>	... Hydraulic or pneumatic actuation
<u>817</u>	... Motor driven actuating screw
<u>818</u>	.. Compressional
<u>819</u>	... Plural specimen or multiaxial loading
<u>820</u>	... Fluid displacement provides indication
<u>821</u>	... To fracture, crushing, or yield point
<u>822</u>	... Plastic flow or creep
<u>823</u>	... Residual deformation (e.g., consolidation)
<u>824</u>	... By rotating squeezing element
<u>825</u>	... With hydraulic or pneumatic actuation
<u>826</u>	.. Tensile
<u>827</u>	... Bond test
<u>828</u>	... Strand or chain test
<u>829</u>	.... By roller
<u>830</u>	.... To failure
<u>831</u>	... Having specified clamp
<u>832</u>	.... Interior to specimen
<u>833</u>	.... Jaws
<u>834</u>	... To failure
<u>835</u>	.... Tear
<u>836</u>	... Pendulum dynamometer
<u>837</u>	... Hydraulic or pneumatic actuation
<u>838</u>	.. Rupture or burst strength of sheet material by transverse loading
<u>839</u>	... Including cutting or piercing element
<u>840</u>	... Hydraulic or pneumatic actuation
<u>841</u>	.. Shear
<u>842</u>	... Bond
<u>843</u>	... By rotary element
<u>844</u>	... Impact (e.g., pendulum)
<u>845</u>	... To fracture or failure
<u>846</u>	... Opposing work holders including specimen
<u>847</u>	.. Torsion
<u>848</u>	... To failure
<u>849</u>	.. Bending, flexing, or folding
<u>850</u>	... Weld testing
<u>851</u>	... To failure or fracture
<u>852</u>	... Loading means intermediate stationary end holders or supports
<u>853</u>	... Having opposite ends of specimen clamped
<u>854</u>	... By angular displacement of opposite ends of specimen
<u>855</u>	. Support, holder, or housing for unspecified type electrical sensing element
<u>856</u>	. Specimen clamp, holder, or support
<u>857</u>	.. With hydraulic or pneumatic actuation of grip
<u>858</u>	.. Winding drum or roller type
<u>859</u>	.. With wedging or camming elements contacting specimen
<u>860</u>	.. Opposed pair

<b><u>104</u></b>	<b>SURFACE AND CUTTING EDGE TESTING</b>
<u>105</u>	. Roughness
<b><u>112</u></b>	<b>POWER PLANT OR UNIT EFFICIENCY</b>
<u>113</u>	. Automobile fuel consumption
<u>114</u>	.. Miles per gallon
<u>115</u>	. Pressure derivative
<b><u>116</u></b>	<b>MOTOR AND ENGINE TESTING</b>
<u>117</u>	. With vehicle wheel supporting roller or belt
<u>117.1</u>	. Utilizing a test chamber or tank to simulate operating conditions
<u>117.2</u>	. Disparate tests under operating conditions
<u>117.3</u>	.. With continuous operation
<u>117.4</u>	. Thrust measurement (e.g., jet engine)
<u>118.1</u>	. Testing auxiliary unit
<u>118.2</u>	.. Intake air flow
<u>119R</u>	. Motor part
<u>120</u>	.. Piston ring
<u>119A</u>	.. Fuel injection tests
<b><u>121</u></b>	<b>BRAKE TESTING</b>
<u>122</u>	. Slidable platform
<u>123</u>	. Roller or belt wheel support
<u>124</u>	.. Relatively shiftable front and rear wheel supports
<u>125</u>	.. Inertia type
<u>126</u>	.. With driving effort indication
<u>127</u>	... Single wheel portable unit
<u>128</u>	. Road test attachment or adjunct
<u>129</u>	. Vehicle installation
<u>130</u>	. Single wheel rotating and resistance measuring means
<u>131</u>	.. Torque measuring lever
<u>132</u>	. Brake depressor with measuring means
<b><u>862</u></b>	<b>DYNAMOMETERS</b>
<u>862.01</u>	. For testing force-biased connections
<u>862.02</u>	.. Ski bindings
<u>862.03</u>	. For testing relative pulling power (e.g., for contests)
<u>862.041</u>	. Responsive to multiple loads or load components
<u>862.042</u>	.. Along or about mutually orthogonal axes
<u>862.043</u>	... Three dimensional (e.g., x, y, z axes)
<u>862.044</u>	.... Using a resistance strain gage
<u>862.045</u>	.. Using a resistance strain gage
<u>862.046</u>	.. Transducer array (e.g., columns and rows)
<u>862.05</u>	.. Applied to guidance means
<u>862.06</u>	.. On machine tools



- 862.07 .. To determine distribution of tensile stress
- 862.08 . Responsive to torque
- 862.09 .. By absorption
- 862.11 ... Having plural brake means
- 862.12 ... Having friction brake means
- 862.13 .... Automatic load control
- 862.14 ... Having fluid brake means
- 862.15 .... Air brakes
- 862.16 .... Automatic load control
- 862.17 ... Having magnetic or electromagnetic brake means
- 862.18 .... Automatic load control
- 862.191 .. During transmission to an external load
- 862.21 ... For making or breaking threaded connections (e.g., torque measuring wrenches)
- 862.22 .... With variable capacity or sensitivity
- 862.23 .... With detection of specific torque value or condition (e.g., peak torque)
- 862.24 ..... Rate of change
- 862.25 .... Power tongs
- 862.26 .... Bending beam type
- 862.27 ... With recording or totalizing means
- 862.28 ... With electrical computation of horsepower
- 862.29 ... By measuring reaction forces of a prime mover
- 862.31 ... By measuring reaction forces of transmission gearing
- 862.321 ... By measuring elastic deformation of a torque transmitting member
- 862.322 .... With rotary to linear conversion
- 862.323 .... Using a flowing fluid (e.g., using a shaft mounted nozzle and baffle)
- 862.324 .... Using a light sensor
- 862.325 .... Using an electrical sensor
- 862.326 ..... Phase angle detection
- 862.327 ..... Vernier type

- 862.328 ..... By plural toothed or notched sensing means
- 862.329 ..... Interlaced teeth
- 862.331 ..... Inductance or reluctance sensor
- 862.332 ..... Variable air gap in a magnetic core
- 862.333 ..... Detecting magnetostrictive or magnetoelastic property
- 862.334 ..... Grooved or slotted torsion shaft
- 862.335 ..... Magnetic sleeve or layer
- 862.336 ..... Particular constituent
- 862.337 ..... Capacitance sensor
- 862.338 ..... Resistance strain gage
- 862.339 ..... With noncontact coupling (e.g., rotary transformer)
- 862.37 ... By measuring the fluid pressure of a hydraulic coupling
- 862.192 ... By measuring angular acceleration
- 862.193 ... By measuring an electrical or magnetic characteristic of a torque delivering electric motor
- 862.194 ... By measuring tension in a drive belt or chain
- 862.195 ... By converting transmitted torque into axial force
- 862.381 . Responsive to force
- 862.391 .. To determine tension on a flexible element
- 862.41 ... By measuring vibrations (e.g., resonant frequency)
- 862.42 ... By applying a measured tensioning force
- 862.43 .... Racket stringing
- 862.44 .... With winding or reeling means
- 862.451 ... By measuring deflection or a deflecting force
- 862.452 .... For testing racket stringing
- 862.453 .... For testing a drive belt
- 862.454 .... Using a fluid for deflection or force measuring
- 862.46 .... With angular deflection
- 862.471 .... Using an elastically deformable force measuring means
- 862.472 ..... With pivoted deflecting member between spaced guides or supports

- 862.473 ..... Electrical sensor
- 862.474 ..... Resistance strain gage
- 862.392 ... By measuring axial force or stretch
- 862.393 .... Pulling force on an anchoring device
- 862.49 .. To determine axial thrust on a rotating machine element
- 862.51 .. With recording means
- 862.52 .. With variable capacity or sensitivity
- 862.53 .. With detection of specific force value or condition (e.g., peak force)
- 862.541 .. Combined
- 862.55 ... With pressure applying roller (e.g., mill roll)
- 862.56 ... With hoisting means
- 862.57 ... With towing means
- 862.542 ... With jack or press
- 862.543 ... With pumping unit
- 862.581 .. By measuring a fluid pressure
- 862.582 ... Using a load responsive valve or restrictor
- 862.583 .... Pneumatic
- 862.584 ... Using a piston
- 862.59 .. By measuring vibrations (e.g., resonant frequency)
- 862.61 .. By measuring a counterbalancing or restoring force
- 862.621 .. By measuring elastic deformation
- 862.622 ... With compensation
- 862.623 .... Temperature
- 862.624 ... Using a light sensor
- 862.625 ... Using a specific type of electrical sensor
- 862.626 .... Inductance or capacitance sensor
- 862.627 .... Resistance strain gage
- 862.628 ..... Including a specific type of electrical circuit
- 862.629 ..... Specific type of elastic member

- 862.631 ..... Axle or pivot pin
- 862.632 ..... Flexible element (e.g., beam, plate, or web)
- 862.633 ..... Parallel
- 862.634 ..... Cantilever
- 862.635 ..... Closed loop (e.g., ring or tube)
- 862.636 ... Specific type of elastic member
- 862.637 .... Flexible element (e.g., beam, plate, or web)
- 862.638 ..... Parallel
- 862.639 ..... Cantilever
- 862.641 .... Helical or spiral
- 862.642 .... Closed loop (e.g., ring or tube)
- 862.68 .. By measuring electrical properties
- 862.69 .. By measuring magnetic properties
- 862.382 .. With detail of overload protection
- 146 TIRE, TREAD OR ROADWAY**
- 146.2 . Tire inflation testing installation
- 146.3 .. By direct fluid pressure reading
- 146.4 ... Telemetric (e.g., indicator on cowl)
- 146.5 .... Electric
- 146.8 ... Tire stem attachments
- 147 WIND TUNNEL: AERODYNAMIC WING AND PROPELLER STUDY**
- 148 MODEL BASIN AND TESTING TANK**
- 149 VOLUMETRIC CONTENT MEASURING**
- 150R COATING MATERIAL: INK ADHESIVE AND/OR PLASTIC**
- 150A . Bond strength
- 152.01 BOREHOLE OR DRILLING (E.G., DRILL LOADING FACTOR, DRILLING RATE, RATE OF FLUID FLOW)**
- 152.02 . Formation logging (e.g., borehole studies of pressure derivatives or of pressure-temperature derivatives)
- 152.03 .. During drilling
- 152.04 ... By drill mud analysis
- 152.05 .. Density, porosity, or permeability
- 152.06 ... Including oil, gas, or water saturation

<u>152.07</u>	... By a core sample analysis
<u>152.08</u>	.. Oil, gas, or water saturation
<u>152.09</u>	... By a core sample analysis
<u>152.11</u>	.. By a core sample analysis
<u>152.12</u>	.. Thermal
<u>152.13</u>	... With heating or cooling
<u>152.14</u>	.. With radioactivity measuring
<u>152.15</u>	... With vibration measuring
<u>152.16</u>	.. With vibration measuring
<u>152.17</u>	.. With detail of a borehole wall engaging means
<u>152.18</u>	. Fluid flow measuring or fluid analysis
<u>152.19</u>	.. During drilling
<u>152.21</u>	... Rate of fluid flow
<u>152.22</u>	... Pressure
<u>152.23</u>	.. With sampling
<u>152.24</u>	... From formation wall
<u>152.25</u>	.... With a filter
<u>152.26</u>	.... With sealing detail
<u>152.27</u>	... Pressure
<u>152.28</u>	... Downhole
<u>152.29</u>	.. Rate of fluid flow
<u>152.31</u>	... Plural diverse measuring
<u>152.32</u>	... Vibration
<u>152.33</u>	... Thermal
<u>152.34</u>	... Rotary
<u>152.35</u>	.... Magnetic
<u>152.36</u>	... Packer or deflector detail
<u>152.37</u>	.. Steady state fluid flow interruption
<u>152.38</u>	... Drawdown or shutin test

- 152.39 .. Fluid injection into formation
- 152.41 ... Determining permeability or saturation
- 152.42 .. Determining relative proportion of fluid constituent
- 152.43 . During drilling
- 152.44 .. Drill depth rate
- 152.45 ... Electronic processing or electronic recording
- 152.46 .. Downhole measurement
- 152.47 ... Vibration
- 152.48 ... Force
- 152.49 .. Force
- 152.51 . Pressure measurement
- 152.52 .. Plural diverse measurements
- 152.53 .. With recorder
- 152.54 . Downhole test
- 152.55 .. Fluid test
- 152.56 .. Free point or stuck point
- 152.57 .. Casing or cementing
- 152.58 .. Using vibration
- 152.59 .. By measurement of response due to force
- 152.61 . Pump test
- 152.62 .. With recorder
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- 156** **STATISTICAL RECORD VERIFYING**
- 157** **RECORD STRIP SPROCKET HOLE TESTING**
- 158** **HOISTING CABLE AND ROPE**
- 159** **SHEET, WOVEN FABRIC OR FIBER**
- 160** . Filament
- 161** **SPRING TESTING**
- 162** **TOOTHED GEAR**
- 163** **COIN**
- 164** **MINER'S LAMP**
- 167** **ORDNANCE AND PROJECTILE**
- 168** **BLOWER, PUMP, AND HYDRAULIC EQUIPMENT**
- 169** **FLOUR, DOUGH, OR BREAD**
- 172** **ORTHOPEDIC PRESSURE DISTRIBUTION**
- 178R** **NAVIGATION**
- 
- 179 . Rate of climb (pressure type)

- 180 . Leeway incidence or side-slip
- 181 . Ship's log
- 182 .. Pressure differential type
- 183 ... With integrating means
- 184 .. Drag type
- 185 ... Rotary
- 186 .. Vane type
- 187 .. Rotary
- 178H . Helicopter
- 178T . Take-off and landing monitors
- 170.01 FLUID FLOW DIRECTION (E.G., WIND SOCK, WEATHER VANE, ETC.)**
- 170.02 . Relative to aircraft or watercraft
- 170.03 .. Sailboat (e.g., sailing aid)
- 170.04 . Using a drifter or tracer (e.g., smoke)
- 170.05 . Using a fluid actuated alignment device (e.g., wind sock, weather vane, etc.)
- 170.06 .. With illumination means or an electro-optical indicator (e.g., beacon or signal lamp)
- 170.07 .. With velocity determination
- 170.08 ... Electric sensor
- 170.09 .. Electric sensor
- 170.11 . With velocity determination
- 170.12 .. Thermal
- 170.13 .. Acoustic
- 170.14 .. Fluid pressure differential
- 170.15 .. Thrust or drag force
- 170.16 METEOROLOGY**
- 170.17 . Precipitation (e.g., rain gauge)
- 170.18 .. With recorder detail
- 170.19 .. With heater or vaporizer
- 170.21 .. Sensing accumulated amount (e.g., rain gauge)
- 170.22 ... Using a float
- 170.23 ... Weight actuated (e.g., tipping bucket)
- 170.24 . Electric disturbance (e.g., lightning)
- 170.25 . Micrometeorite
- 170.26 . Icing condition (e.g., accretion)

- 170.27 . Naturally occurring radiation (e.g., solar radiation)
- 170.28 . Using unmanned, self-controlled airborne instrumentation carrier (e.g., radiosonde)

**170.29 OCEANOLOGY (E.G., OCEANS, RIVERS, OR LAKES)**

- 170.31 . Surface wave
- 170.32 . Bottom sediment or soil
- 170.33 . Towed probe
- 170.34 . Unattached, self-contained probe with buoyancy controlled level of descent

**861 VOLUME OR RATE OF FLOW**

- 861.01 . With indirect temperature or density compensation
- 861.02 .. Electrical
- 861.03 ... Digital
- 861.04 . Of selected fluid mixture component
- 861.05 . By measuring transit time of tracer or tag
- 861.06 .. With autocorrelation or cross-correlation detection
- 861.95 .. Thermal tracer or tag
- 861.07 . By measuring tracer concentration
- 861.08 . By measuring electrical or magnetic properties
- 861.09 .. Ionization type
- 861.11 .. Electromagnetic induction (e.g., Faraday type)
- 861.12 ... With detecting electrodes
- 861.13 .... Including permanent magnet or D.C. field
- 861.14 .... For dielectric fluids
- 861.15 .... Plural pairs of detecting electrodes
- 861.16 .... Including electrically interconnected or synchronized input and output circuit
- 861.17 ..... Selective or periodic sampling
- 861.18 . By measuring vibrations or acoustic energy
- 861.19 .. Produced by fluidic oscillator
- 861.21 .. Caused by fluid interaction with obstacle
- 861.22 ... Vortex shedders



- 861.23 .... Acoustic
- 861.24 .... Movable sensor responsive to vortices
- 861.25 .. Reflection or scattering of acoustic waves
- 861.26 .. Deflection of acoustic waves
- 861.27 .. Transit time of acoustic waves
- 861.28 ... Transmitted along single path
- 861.29 .... In both directions simultaneously
- 861.31 ... Transmitted along parallel paths
- 861.32 . By measuring swirl rate imparted by static means
- 861.33 .. With turbine in a swirl chamber
- 861.34 .. Precess type
- 861.351 . Mass flow by imparting angular or transverse momentum to the fluid
- 861.352 .. Rotated resiliently coupled elements
- 861.353 .. Reaction turbine or vane
- 861.354 .. Coriolis or gyroscopic
- 861.355 ... Vibrated conduit
- 861.356 .... Signal processing or analysis details
- 861.357 .... Drive and sensor element located on straight conduit portion
- 861.39 . Using an applied fluid jet
- 861.41 . By counting drops, bubbles, or particles
- 195 . System
- 196 .. Flow comparing
- 197 .. Compound meter
- 198 . Combined
- 199 .. With pressure regulator or demand limit
- 200 .. With gas and liquid separator
- 201 .. With connection or box
- 202 . Proportional
- 202.5 .. Thermal sensing of flow
- 203 .. With valved proportioning means
- 204.11 . Thermal type
- 204.12 .. With conduit extending between heat sinks
- 204.13 .. With auxiliary fluid contacting or in heat exchange relation with flow path (e.g., thermodilution)

- 204.14 .. Including digital or pulse measuring circuitry
- 204.15 .. Including detail of feedback or rebalancing circuitry
- 204.16 ... By control of a separate heating or cooling element
- 204.17 .. With distinct heating circuitry for a self-heated sensor
- 204.18 .. Including response characteristic or condition compensation
- 204.19 ... For temperature
- 204.21 .. With fluid flow deflector or restrictor (e.g., baffle, constriction)
- 204.22 .. With sensor housing
- 204.23 .. Having particular electrical heating, cooling, or thermal sensing element
- 204.24 ... Thermoelectric junction
- 204.25 ... Resistive element
- 204.26 .... With substrate carrier (e.g., thin film)
- 204.27 .... Wire type (e.g., hot wire)
- 861.42 . Using differential pressure
- 861.43 .. With time integration
- 861.44 ... By electrical means
- 861.45 ... By mechanical means
- 861.46 .... Including pressure applied to liquid column or reservoir
- 861.47 .. Pressure applied to movable member (e.g., a diaphragm)
- 861.48 ... With linearization (e.g., square root extraction)
- 861.49 .. Pressure applied to liquid column or reservoir
- 861.51 ... With linearization
- 861.52 .. With restriction
- 861.53 ... Automatically variable restriction
- 861.54 .... Slotted piston or cylinder
- 861.55 .... Cone and ball or disk
- 861.56 ..... With structure of coupling to indicator
- 861.57 ..... With structure of float, float tube, or float guide
- 861.58 .... Orifice and tapered plug

- 861.59 ... Including recirculation pump
- 861.61 ... Orifice or flow nozzle
- 861.62 .... Adjustable
- 861.63 ... Venturi
- 861.64 .... Inlet or outlet structure
- 861.65 .. Pitot
- 861.66 ... Sensing at plural transverse locations
- 861.67 ... Adjustable
- 861.68 ... With heating element
- 861.69 .. Centrifugal
- 215 . Weir type
- 216 .. Submerged orifice or discharge nozzle
- 217 . Tank type
- 218 .. Rotary tank or bucket
- 219 ... With power drive
- 220 .. Plural measuring chamber
- 221 ... With fluid-pressure operated valve
- 222 ... With float operated valve
- 223 ... With siphon discharge
- 224 .. Single measuring chamber
- 225 ... With float operated valve
- 226 .... With trip gear
- 227 ... With siphon discharge
- 861.71 . Area-velocity integrating
- 861.71 . By measuring thrust or drag forces
- 861.72 .. By changing fluid direction
- 861.73 .. Impact of particulate material
- 861.74 .. On a vane
- 861.75 ... With rotation about a fixed axis
- 861.76 .... Spring biased
- 861.77 . Using rotating member with particular electrical output or circuit
- 861.78 .. With pick-up coil
- 861.79 . Using turbine
- 861.81 .. With response modification
- 861.82 ... Pressure responsive valve or restriction
- 861.83 ... Axial supply and delivery

- 861.84 .... Differentially responsive turbines
- 861.85 .. Anemometers
- 861.86 .. With fluid directed radially outward
- 861.87 .. With flow direction retained in a plane perpendicular to turbine axis
- 861.88 ... Mechanical coupling to indicator
- 861.89 .. Axial supply and delivery
- 861.91 ... With structure to reduce friction or wear
- 861.92 ... With structure of bearing or turbine support structure
- 861.93 ... With mechanical coupling to indicator
- 861.94 ... With magnetic coupling drive assembly
- 232 . Expansible chamber
- 233 .. With variable indicator drive
- 234 .. Wet type (e.g., liquid seal)
- 235 ... Rotary drum
- 236 ... Oscillating bell or drum
- 237 ... Reciprocating bell
- 238 ... Nutating bell
- 239 .. Reciprocating piston or cylinder
- 240 ... Transversely reciprocating piston and cylinder
- 241 ... Oscillating cylinder
- 242 ... Valveless
- 243 ... Duplex
- 244 .... Wobble plate or cam
- 245 .... With transverse shaft
- 246 ..... With single distributing valve
- 247 ... Radial cylinder
- 248 ... Valved piston
- 249 ... With fluid actuated valve
- 250 ... With piston or rod actuated valve gear
- 251 .... With trip gear
- 252 .. Oscillating piston
- 253 .. Rotary piston or cylinder
- 254 ... With compensating bypass
- 255 ... With orbital movement
- 256 .... Plural stationary abutment
- 257 .... Single stationary abutment
- 258 ..... Nutating piston
- 259 ... With sliding vane
- 260 ... With swinging vane
- 261 ... With interengaging pistons
- 262 .. Diaphragm or collapsible wall
- 263 ... Multiple diaphragm
- 264 .... Duplex
- 265 .... With rotary valve
- 266 ..... Crank operated
- 267 ..... With flag rod
- 268 .... With oscillating or reciprocating valve
- 269 ... Single diaphragm

<u>270</u>	.... With diaphragm actuated valve trip gear
<u>271</u>	.... With fluid actuated valve
<u>272R</u>	. Element
<u>273</u>	.. Casing
<u>274</u>	... Diaphragm meter type
<u>275</u>	.. Antireversing mechanism
<u>276</u>	... Check valve
<u>277</u>	.. "Frostproof" construction
<u>278</u>	.. Diaphragm mounting
<u>279</u>	.. Diaphragm
<u>280</u>	... With oiling structure
<u>281</u>	.. Tangent adjustment
<u>272A</u>	.. With remote register
<b><u>290R</u></b>	<b>LIQUID LEVEL OR DEPTH GAUGE</b>

<u>291</u>	. With other measuring device
<u>292</u>	.. Thermometer
<u>293</u>	. With illumination
<u>294</u>	. With funnel or hose nozzle
<u>295</u>	. Thermal type
<u>296</u>	. Weighing type
<u>297</u>	. Test cock type
<u>298</u>	. Exploring tube
<u>299</u>	. Hydrostatic pressure type
<u>300</u>	.. Bathometer type
<u>301</u>	.. With electrically controlled indicator
<u>302</u>	.. With fluid displacement or replenishment
<u>303</u>	... Suction type or vacuum tank action
<u>304R</u>	. Immersible electrode type
<u>304C</u>	.. Capacitative
<u>305</u>	. Float
<u>306</u>	.. Combined
<u>307</u>	... With warning signal or alarm
<u>308</u>	.... Electric
<u>309</u>	.. Buoyancy type
<u>310</u>	.. Total registering
<u>311</u>	.. Multiple floats
<u>312</u>	.. Recording
<u>313</u>	.. With electrically controlled indicator
<u>314</u>	.. With position sensing
<u>315</u>	.. With float lock
<u>316</u>	.. With fluid transmission
<u>317</u>	.. Pivoted float arm
<u>318</u>	... With flexible cable transmission
<u>319</u>	.. Vertically reciprocable
<u>320</u>	... With spiral cam or guide
<u>321</u>	... With flexible cable transmission
<u>322</u>	... Indicator stem attached
<u>322.5</u>	.. Float structure
<u>323</u>	. Sight glass
<u>324</u>	.. With cleaner
<u>325</u>	.. With guard or casing
<u>326</u>	... Boiler type
<u>327</u>	.. Reflector or magnifier
<u>328</u>	.. Boiler type
<u>329</u>	... Duplex or multiple section
<u>330</u>	... Transparent closure plate type

- 331 .... Bull's eye type
- 332 ... With valve
- 333 .... Safety feature
- 334 .. Transparent closure plate type
- 290B . Ullage volume
- 290V . Vibratory type

**379.01 MUSCULAR FORCE (E.G., STRENGTH TESTING, EXERCISING OR TRAINING EFFORT, ETC.)**

- 379.02 . Jaw or hand (e.g., gripping, pinching, or biting)
- 379.03 .. Using a resilient force-resister
- 379.04 . Impact
- 379.05 .. Using a resilient force-resister
- 379.06 . Including a rotary element with a braking means (e.g., friction brake)
- 379.07 .. Pedal driven (e.g., cycle ergometer)
- 379.08 . Using a resilient force-resister
- 379.09 . Using hydraulic or pneumatic force-resister

**382R GRAVITATIONAL DETERMINATION**

- 383 . Torsion balance
- 382G . Gravitational variation
- 488 SPEED, VELOCITY, OR ACCELERATION**
- 489 . Recording or registering interrelated factors
- 490 . With distance registering means
- 491 . With means for retaining reading
- 492 .. Maximum acceleration
- 493 . Structural installation or mounting means
- 494 .. Installed in rotary speed source
- 495 . Indicating diverse conditions
- 496 . Vibration control or antistick means for reading structure
- 497 . Temperature compensator
- 498 . Adjusting means for reading structure
- 499 . Illuminated reading device
- 500 . Liquid surface is or moves reading means
- 501 .. Surface of revolving liquid body
- 502 . Externally connected pressure gauge gives reading
- 503 . Means integrating time and acceleration
- 503.3 .. Gyroscope

- 504.01 . Angular rate using wave or beam motion (e.g., Sagnac type)
- 504.02 . Angular rate using gyroscopic or Coriolis effect
- 504.03 .. Multisensor for both angular rate and linear acceleration
- 504.04 ... Vibratory mass
- 504.05 .. Fluid or fluent inertial mass (e.g., electrons, ions, plasma)
- 504.06 ... Fluid jet

<u>504.07</u>	... Rotary
<u>504.08</u>	.. Rotary gyroscope
<u>504.09</u>	... Gimbal support
<u>504.11</u>	... Flexible rotor or flexibly mounted rotor
<u>504.12</u>	.. Vibratory mass
<u>504.13</u>	... Hollow circular-shaped inertial element
<u>504.14</u>	... Elongated element with spaced supports
<u>504.15</u>	... Cantilever
<u>504.16</u>	.... Tuning fork
<u>504.17</u>	. Angular rate using a fluid vortex rate sensor
<u>504.18</u>	. With rotary gyroscope
<u>506</u>	. Means integrating intermittent speed source impulses
<u>507</u>	. Comparison to a fixed standard, master or reference speed device
<u>508</u>	. With governor drive failure responsive means
<u>509</u>	. With response to a nonspeed condition
<u>510</u>	. Response to multiple sensing means or motion conditions
<u>511</u>	.. Response to both velocity and acceleration
<u>512</u>	... Centrifugal-type velocity sensor and separate inertial means
<u>513</u>	. With manual control
<u>514.01</u>	. Acceleration determination utilizing inertial element
<u>514.02</u>	.. Angular acceleration
<u>514.03</u>	... Fluid or fluent inertial mass (e.g., electrons, ions, plasma)
<u>514.04</u>	... Inertial flywheel
<u>514.05</u>	.. Fluid or fluent material
<u>514.06</u>	... Fluid or fluent material support of an inertial element
<u>514.07</u>	.... Gas
<u>514.08</u>	.... Magnetic fluid
<u>514.09</u>	... Fluid or fluent inertial mass
<u>514.11</u>	... Detection by fluid pressure
<u>514.12</u>	... Fluid or fluent material dampening of an inertial element
<u>514.13</u>	.... Gas
<u>514.14</u>	.. Specific type of dampener (e.g., eddy current dampener)
<u>514.15</u>	.. Spinning or vibrating accelerometer

- 514.16 .. Specific type of electric sensor or specific type of magnetic sensor
- 514.17 ... Rebalance
- 514.18 .... Electrostatic restoring means
- 514.19 .... Radiant energy sensor (e.g., optical, charged, or radioactive particle)
- 514.21 .... Pendulum or beam
- 514.22 ..... Including a bearing support
- 514.23 ..... Including a flexure support
- 514.24 .... Including an elastic support for an inertial element (e.g., spring)
- 514.25 ... Charged particle or radioactive particle sensor
- 514.26 ... Optical sensor
- 514.27 .... Frequency or phase shift
- 514.28 ... Surface acoustical wave
- 514.29 ... Having a vibrating element
- 514.31 ... Inductive or magnetic sensor (e.g., Hall effect sensor)
- 514.32 ... Capacitive sensor
- 514.33 ... Resistive sensor
- 514.34 ... Piezoelectric sensor
- 514.35 .. Electric
- 514.36 .. Pendulum or beam
- 514.37 ... Including a pivot support
- 514.38 .. Including an elastic support for an inertial element (e.g., spring)
- 514.39 . Magnetic speed measuring or mechanical speed measuring with ancillary magnetic means or with ancillary electrical means
- 519.01 .. Eddy current drag means (e.g., drag cup)
- 520.01 ... With a flux adjusting means
- 521 . Fluid
- 522 .. Dampening means
- 523 .. Expansible chamber devices
- 524 .. Fluid coupling or torque convertor type
- 525 .. Brake (e.g., vanes in air)
- 526 . With dampening or shock-absorbing means
- 527 . With input means
- 528 .. Selective speed transmitter
- 529 .. Frictional (e.g., friction wheels)
- 530 . With output transmitting mechanism



<u>531</u>	.. With transmission adjustment means
<u>532</u>	.. Gear
<u>533</u>	... Rectilinear rack
<u>534</u>	.. Surface and follower
<u>535</u>	. Centrifugal weight type
<u>536</u>	.. Weight lever arm or pivot automatically variable during operation
<u>537</u>	.. Bias automatically variable during operation
<u>538</u>	... Snap action
<u>539</u>	.. Limit stop for weight
<u>540</u>	.. With adjusting means
<u>541</u>	... Diverse
<u>542</u>	... Biasing weight
<u>543</u>	... Lever or gear adjustor
<u>544</u>	... Adjusting screw means and bias spring concentric to centrifugal axis
<u>545</u>	... Spring and adjustor connect paired weights
<u>546</u>	.. Leaf spring biasing means
<u>547</u>	.. Toggle joint mounted
<u>548</u>	.. Radially projecting striker type
<u>549</u>	.. Rigid mass crossing axis at an acute angle
<u>550</u>	.. Weighted bell crank lever type
<u>551</u>	.. Surface and follower (e.g., cam or weight as wedge)
<b><u>384</u></b>	<b>BAROMETER (E.G., ALTIMETER)</b>
<u>385</u>	. Mercury
<u>386</u>	. Aneroid
<u>387</u>	.. Settable
<b><u>700</u></b>	<b>FLUID PRESSURE GAUGE</b>
<u>701</u>	. Null balance type
<u>702</u>	. Vibration type
<u>703</u>	.. Ultrasonic
<u>704</u>	.. Vibrating strip or wire
<u>705</u>	. Photoelectric
<u>706</u>	. With protective separator
<u>707</u>	. With fluid pulsation dampener
<u>708</u>	. With pressure and/or temperature compensation
<u>709</u>	. With excess or maximum registering
<u>710</u>	. With steam trap
<u>711</u>	. With variable drive
<u>712</u>	. With recorder
<u>713</u>	. With float
<u>714</u>	. Combined
<u>715</u>	. Diaphragm
<u>716</u>	.. Multiple and/or differential
<u>717</u>	... With electrical readout
<u>718</u>	.... Capacitive
<u>719</u>	.... Resistive
<u>720</u>	..... Strain gauge
<u>721</u>	..... Piezoresistive
<u>722</u>	.... Electromagnetic
<u>723</u>	.. With electrical readout
<u>724</u>	... Capacitive
<u>725</u>	... Resistive
<u>726</u>	.... Strain gauge
<u>727</u>	..... Piezoresistive
<u>728</u>	... Electromagnetic
<u>729.1</u>	.. Bellows
<u>729.2</u>	.. Capsule

<u>730</u>	.. Expansible conduit
<u>731</u>	.. Sack
<u>732</u>	. Bourdon
<u>733</u>	.. With electrical readout
<u>734</u>	... Resistive
<u>735</u>	... Electromagnetic
<u>736</u>	.. Multiple and/or differential
<u>737</u>	.. Intermediately supported
<u>738</u>	.. Safety pressure release casing
<u>739</u>	.. With mechanism dampening
<u>740</u>	.. With zeroizing adjustment
<u>741</u>	.. Bourdon tube and mounting
<u>742</u>	... Helical Bourdon tube
<u>743</u>	... Spiral Bourdon tube
<u>744</u>	. Piston
<u>745</u>	.. With electrical readout
<u>746</u>	... Resistive
<u>747</u>	. U-tube liquid column
<u>748</u>	.. Sphygmomanometer
<u>749</u>	.. With electrical readout
<u>750</u>	... Resistive
<u>751</u>	. Balance
<u>752</u>	. McLeod type
<u>753</u>	. Electrical
<u>754</u>	.. Semiconductor
<u>755</u>	.. Pirani type
<u>756</u>	. Mounting and connection
<b><u>863</u></b>	<b>SAMPLER, SAMPLE HANDLING, ETC.</b>
<u>863.01</u>	. Automatic control
<u>863.02</u>	.. Quantity or rate of flow responsive
<u>863.03</u>	... Rate of sample flow continuously controlled
<u>863.11</u>	. With heating or cooling
<u>863.12</u>	.. And separation
<u>863.21</u>	. With constituent separation
<u>863.22</u>	.. Particle impact
<u>863.23</u>	.. Sieve, filter, or semipermeable membrane
<u>863.24</u>	... Cleaning
<u>863.25</u>	... Changing feature
<u>863.31</u>	. Plural parallel systems
<u>863.32</u>	.. Pipette
<u>863.33</u>	.. Plural capture, single receiver
<u>863.41</u>	. Flow divider, deflector, or interceptor
<u>863.42</u>	.. Attached to mouth of dumpable receptacle

- 863.43 .. Having precapture flow guide or homogenizer
- 863.44 ... Oscillating or reciprocating
- 863.45 ... Rotary
- 863.51 .. Having an upstream-facing-opening-type capture element
- 863.52 ... With receptacle
- 863.53 .... Mounted for flow zone traverse
- 863.54 ... Mounted for reciprocation
- 863.55 ... Oscillating
- 863.56 ... Rotary
- 863.57 ... With blocking means
- 863.58 ... Pitot tube type
- 863.61 .. Branched conduit
- 863.71 . Conduit or passageway section capture chamber
- 863.72 .. Single valve unit
- 863.73 ... Capture chamber within valve unit
- 863.81 . Withdrawing through conduit or receptacle wall
- 863.82 .. Capture element movable to plural loci
- 863.83 .. With metering means or pump
- 863.84 ... Expansible chamber
- 863.85 .. Lock or seal for sampler insertion or removal
- 863.86 .. Valve or restriction
- 863.91 . Conveyor coacting
- 863.92 .. Integral with conveyor structure
- 864 . Capture device
- 864.01 .. Pipette or cannula
- 864.02 ... Self-filling of self-limiting
- 864.03 ... With user mouth protection
- 864.11 ... With suction applying and liquid discharge means
- 864.12 .... With separate diluent supply

- 864.13 .... Piston within pipette
- 864.14 .... With particular connection or release means
- 864.15 .... With valve for connection to external pressure source
- 864.16 .... Piston and cylinder
- 864.17 ..... Plural
- 864.18 ..... Plural or adjustable limit stops
- 864.21 ... With sample supply to analyzer
- 864.22 ... With pipette contacting second fluid supply
- 864.23 ... Pipette fixed; source movable
- 864.24 ... Pipette longitudinally movable
- 864.25 .... And transversely movable
- 864.31 .. With capture device transporter
- 864.32 ... Cyclically operated scoop
- 864.33 .. Capture by fluid current
- 864.34 .. Sample meter or pump
- 864.35 ... Chamber with alternate pressure or vacuum applier
- 864.41 .. Cutter, tearer, or scraper
- 864.42 ... Jaw
- 864.43 ... Auger or drill
- 864.44 ... Corer
- 864.45 .... With corer advancing means
- 864.51 .. Receptacle type
- 864.52 ... Preevacuated
- 864.53 ... Mold
- 864.54 .... With suction applier
- 864.55 .... With diminutive fill passageway
- 864.56 ..... Mating sections
- 864.57 ..... Labyrinth
- 864.58 .... With sample conditioner

<u>864.59</u>	.... With holder or connector
<u>864.61</u>	... Fluid displacement
<u>864.62</u>	... Expansible chamber
<u>864.63</u>	... With valve or closure
<u>864.64</u>	.... Side opening
<u>864.65</u>	.... Contact actuated
<u>864.66</u>	.... Support force or inertia actuated
<u>864.67</u>	.... Messenger actuated
<u>864.71</u>	.. Material for particulate adhesion
<u>864.72</u>	.. Capillary attraction retention
<u>864.73</u>	.. Conduit
<u>864.74</u>	... With penetrating means
<u>864.81</u>	. Analyzer supplier
<u>864.82</u>	.. Having sample capsule support
<u>864.83</u>	.. Having sample confining chamber
<u>864.84</u>	... Connector for separable holder
<u>864.85</u>	.. Connector for separable holder
<u>864.86</u>	... Septum structure
<u>864.87</u>	... Syringe with connector
<u>864.91</u>	. Sample holder
<u>426</u>	<b>MEASURING VESSEL</b>
<u>427</u>	. With depth indication
<u>428</u>	.. Removable indicator
<u>429</u>	. Capacity adjustable
<u>430</u>	<b>INSTRUMENT MECHANISM DAMPENING</b>
<u>431</u>	<b>INSTRUMENT CASING</b>
<u>865</u>	<b>MASS</b>
<u>865.1</u>	<b>HUMAN STRESS LIMIT (E.G., DECOMPRESSION GAUGE FOR DIVERS)</b>
<u>865.2</u>	<b>HYDRAULIC ALTIMETER</b>
<u>865.3</u>	<b>TESTING BY IMPARTING MOTION</b>
<u>865.4</u>	<b>ANALYZING BODILY MOVEMENT (E.G., SKILLS OR KINETICS OF HANDWRITING)</b>
<u>865.5</u>	<b>PARTICLE SIZE</b>

<b><u>865.6</u></b>	<b>SIMULATED ENVIRONMENT (E.G., TEST CHAMBERS)</b>
<b><u>865.7</u></b>	<b>TOUCH OR TASTE</b>
<b><u>865.8</u></b>	<b>INSPECTING</b>
<b><u>865.9</u></b>	<b>TESTING OF APPARATUS</b>
<b><u>866</u></b>	<b>TESTING OF MATERIAL</b>
<b><u>866.1</u></b>	<b>INSTRUMENT MECHANISM OR TRANSMISSION</b>
<b><u>866.2</u></b>	<b>. Rate of change</b>
<b><u>866.3</u></b>	<b>DISPLAY OR DISPLAY DEVICE DETAILS</b>
<b><u>866.4</u></b>	<b>SPECIMEN MODEL OR ANALOG</b>
<b><u>866.5</u></b>	<b>PROBE OR PROBE MOUNTING</b>
<b><u>432.1</u></b>	<b>MISCELLANEOUS</b>

## CROSS-REFERENCE ART COLLECTIONS

<b><u>900</u></b>	<b>AUTOMATIC GAIN CONTROL</b>
<b><u>901</u></b>	<b>DIGITAL READOUT</b>

## FOREIGN ART COLLECTIONS

**FOR000 CLASS-RELATED FOREIGN DOCUMENTS**

Any foreign patents or non-patent literature from subclasses that have been reclassified have been transferred directly to FOR Collections listed below. These Collections contain ONLY foreign patents or non-patent literature. The parenthetical references in the Collection titles refer to the abolished subclasses from which these Collections were derived.

**FOR100 BORE HOLE AND DRILLING STUDY (73/151)****FOR101 . Drill depth-rate (73/151.5)****FOR102 . Formation logging (73/152)****FOR103 .. By drill mud or core analyst (73/153)****FOR104 .. Thermal (73/154)****FOR105 . Fluid intrusion, theft of flow study (73/155)**

## DIGESTS

**DIG1 VIBRATION****DIG2 MAGNETOSTRICTIVE**

DIG3	<b>HALL EFFECT</b>
DIG4	<b>PIEZOELECTRIC</b>
DIG5	<b>LIQUID LEVELS WITH MAGNETIC TRANSMISSION</b>
DIG8	<b>FLUID CIRCUITS</b>
DIG9	<b>MOLTEN METAL SAMPLERS</b>
DIG10	<b>INSTRUMENT MECHANISMS WITH ACCELERATION COMPENSATION</b>
DIG11	<b>PHOTOELECTRIC CELL</b>

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